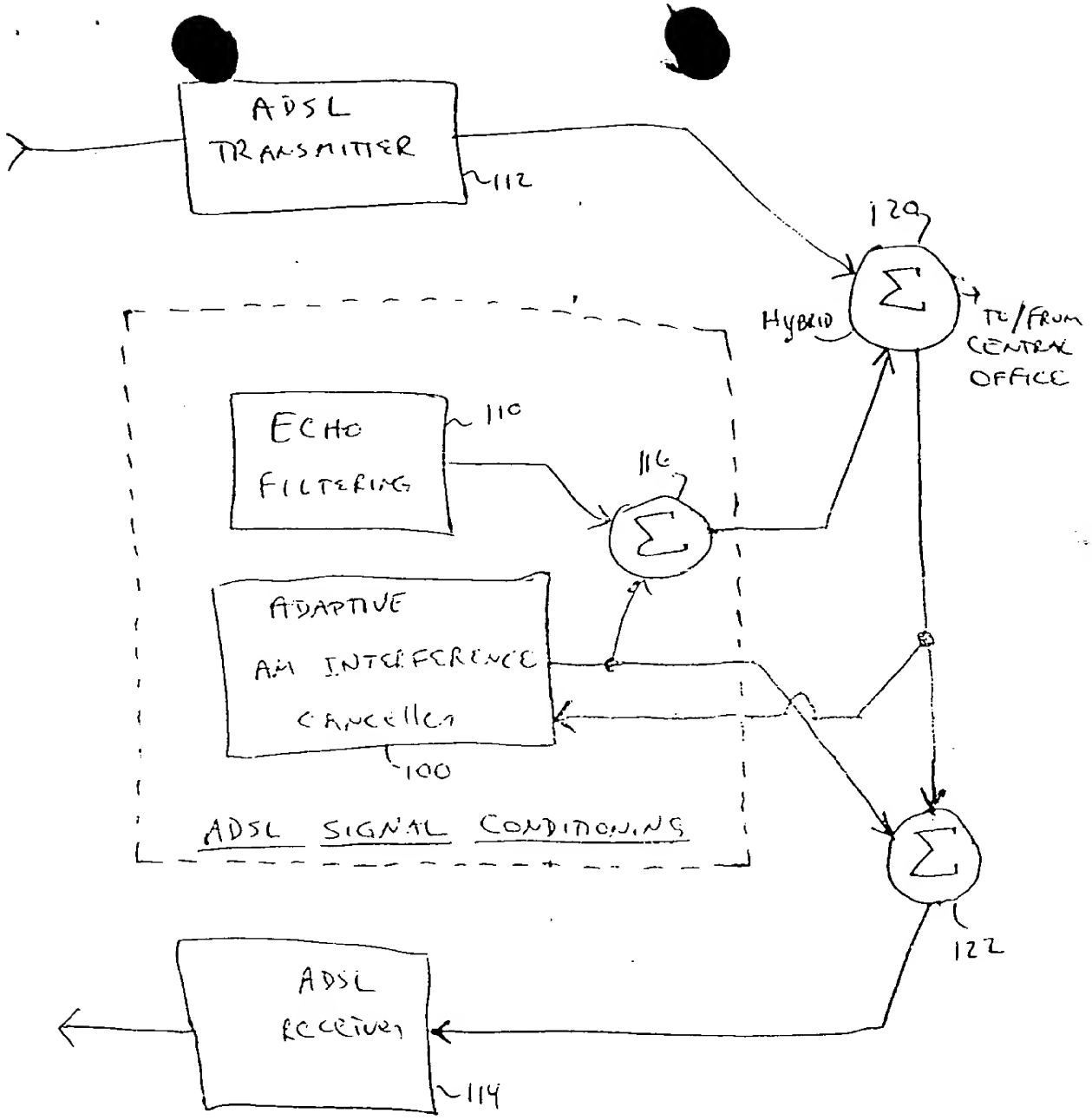

ADSL
TRANSMITTER
112
120
Hybrid
TO/FROM
CENTRAL
OFFICE
ECHO
FILTERING
110
116
ADAPTIVE
AM INTERFERENCE
CANCELLER
100
ADSL SIGNAL CONDITIONING
122
ADSL
RECEIVER
114

FIG. 1

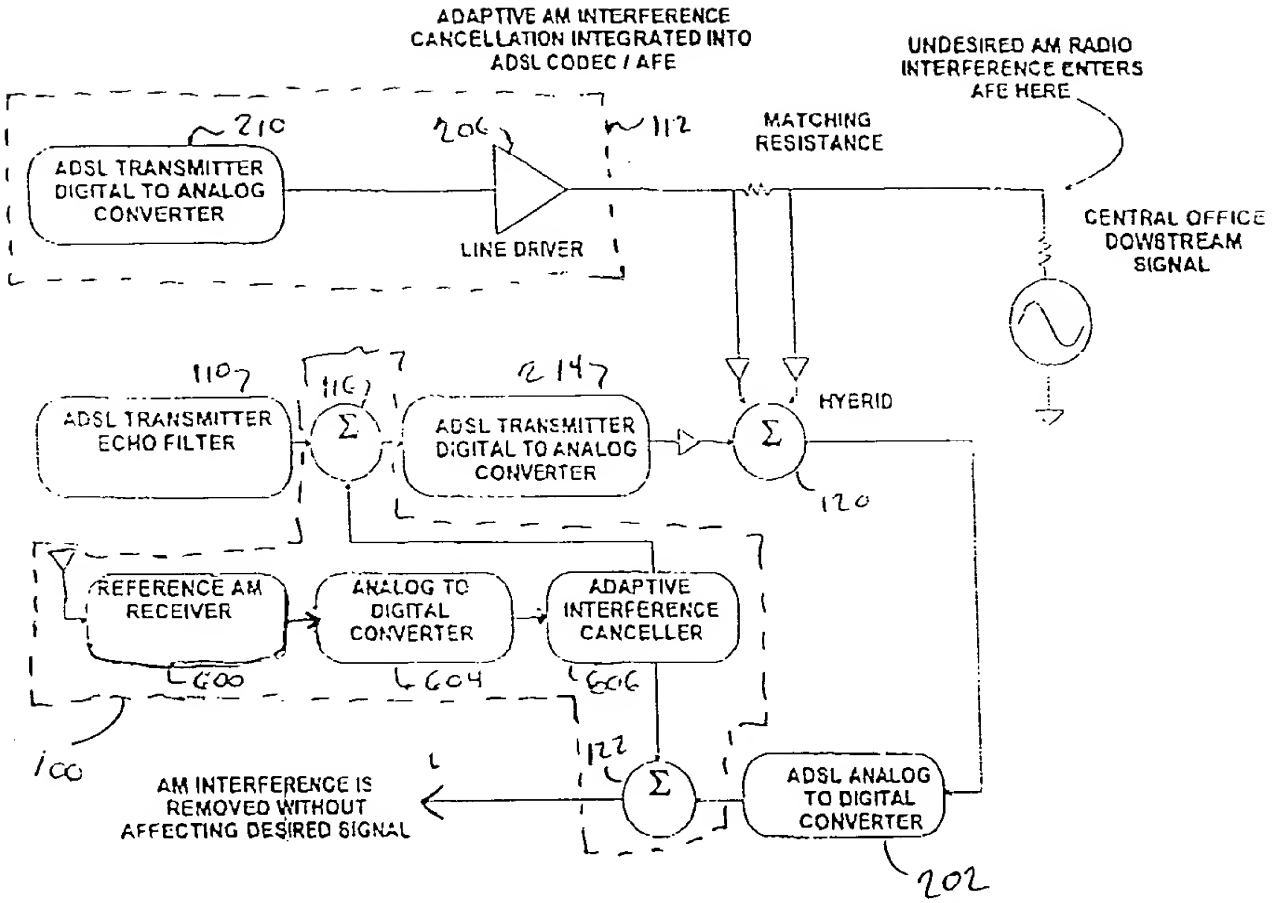

ADAPTIVE AM INTERFERENCE CANCELLATION INTEGRATED INTO ADSL CODEC / AFE
UNDESIRED AM RADIO INTERFERENCE ENTERS AFE HERE
210
206
112
MATCHING RESISTANCE
ADSL TRANSMITTER DIGITAL TO ANALOG CONVERTER
LINE DRIVER
CENTRAL OFFICE DOWSTREAM SIGNAL
110
116
214
ADSL TRANSMITTER ECHO FILTER
ADSL TRANSMITTER DIGITAL TO ANALOG CONVERTER
HYERID
120
REFERENCE AM RECEIVER
ANALOG TO DIGITAL CONVERTER
ADAPTIVE INTERFERENCE CANCELLER
600
604
606
100
122
AM INTERFERENCE IS REMOVED WITHOUT AFFECTING DESIRED SIGNAL
ADSL ANALOG TO DIGITAL CONVERTER
202

FIG. 2

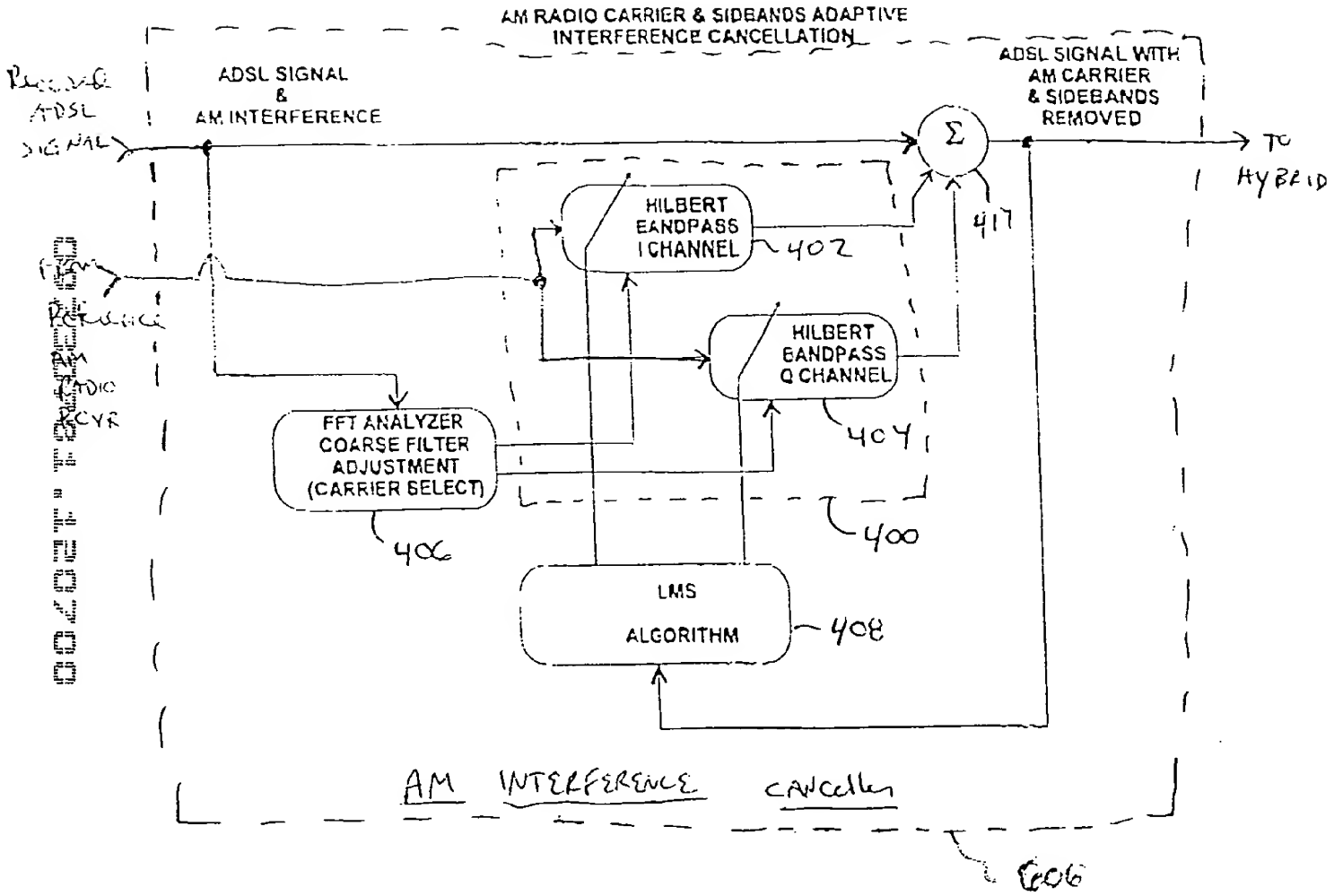

AM RADIO CARRIER & SIDEBANDS ADAPTIVE INTERFERENCE CANCELLATION
ADSL SIGNAL & AM INTERFERENCE
ADSL SIGNAL WITH AM CARRIER & SIDEBANDS REMOVED
Σ
TO HYBRID
417
HILBERT BANDPASS I CHANNEL
402
HILBERT BANDPASS Q CHANNEL
404
FFT ANALYZER COARSE FILTER ADJUSTMENT (CARRIER SELECT)
406
400
LMS ALGORITHM
408
AM INTERFERENCE CANCELLER
606

FIG. 3

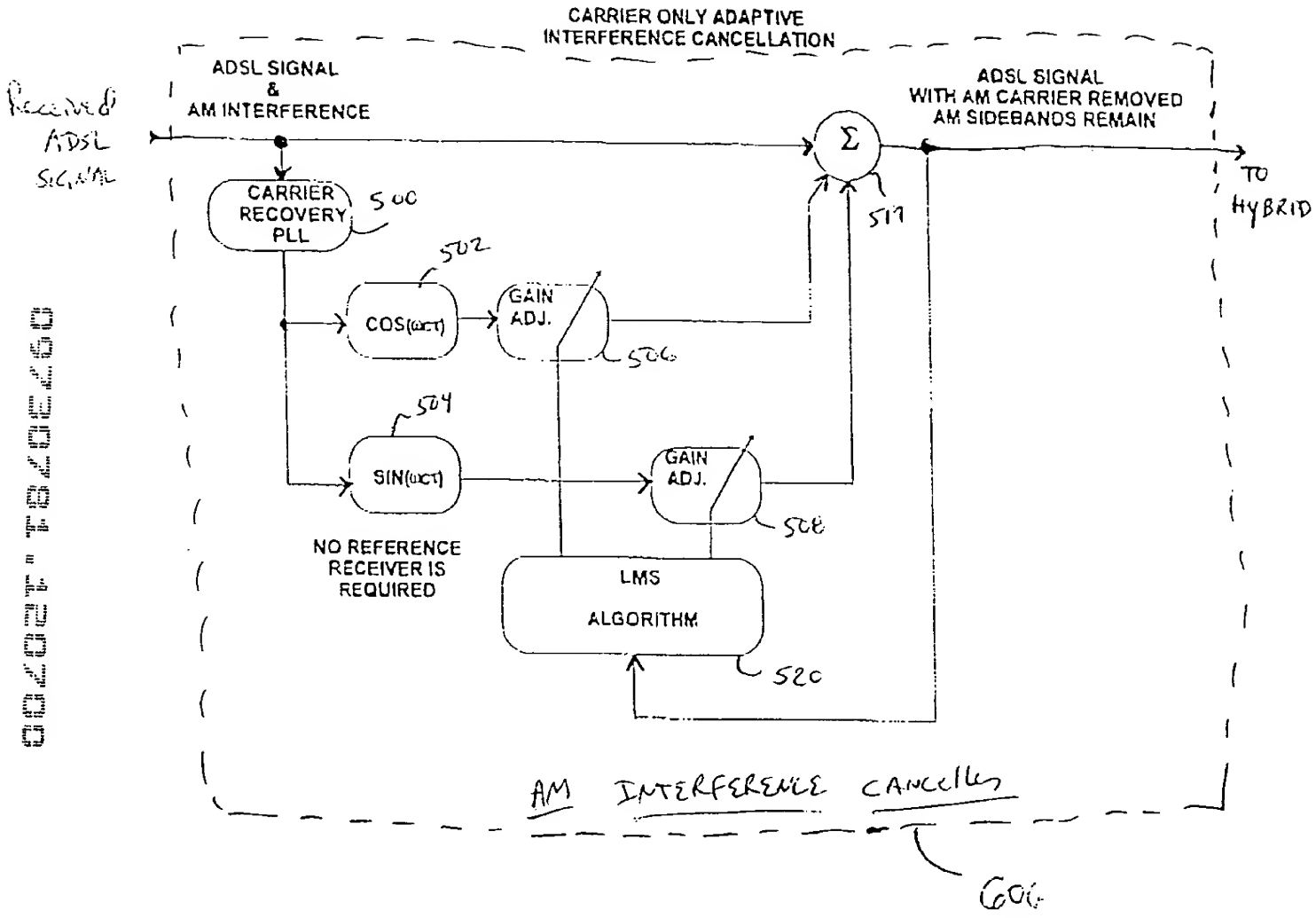

CARRIER ONLY ADAPTIVE
INTERFERENCE CANCELLATION
ADSL SIGNAL
&
AM INTERFERENCE
ADSL SIGNAL
WITH AM CARRIER REMOVED
AM SIDEBANDS REMAIN
Σ
TO
HYBRID
CARRIER
RECOVERY
PLL
500
502
COS(ωCT)
GAIN
ADJ.
506
504
SIN(ωCT)
GAIN
ADJ.
508
NO REFERENCE
RECEIVER IS
REQUIRED
LMS
ALGORITHM
520
AM INTERFERENCE CANCELLER
600

FIG. 4

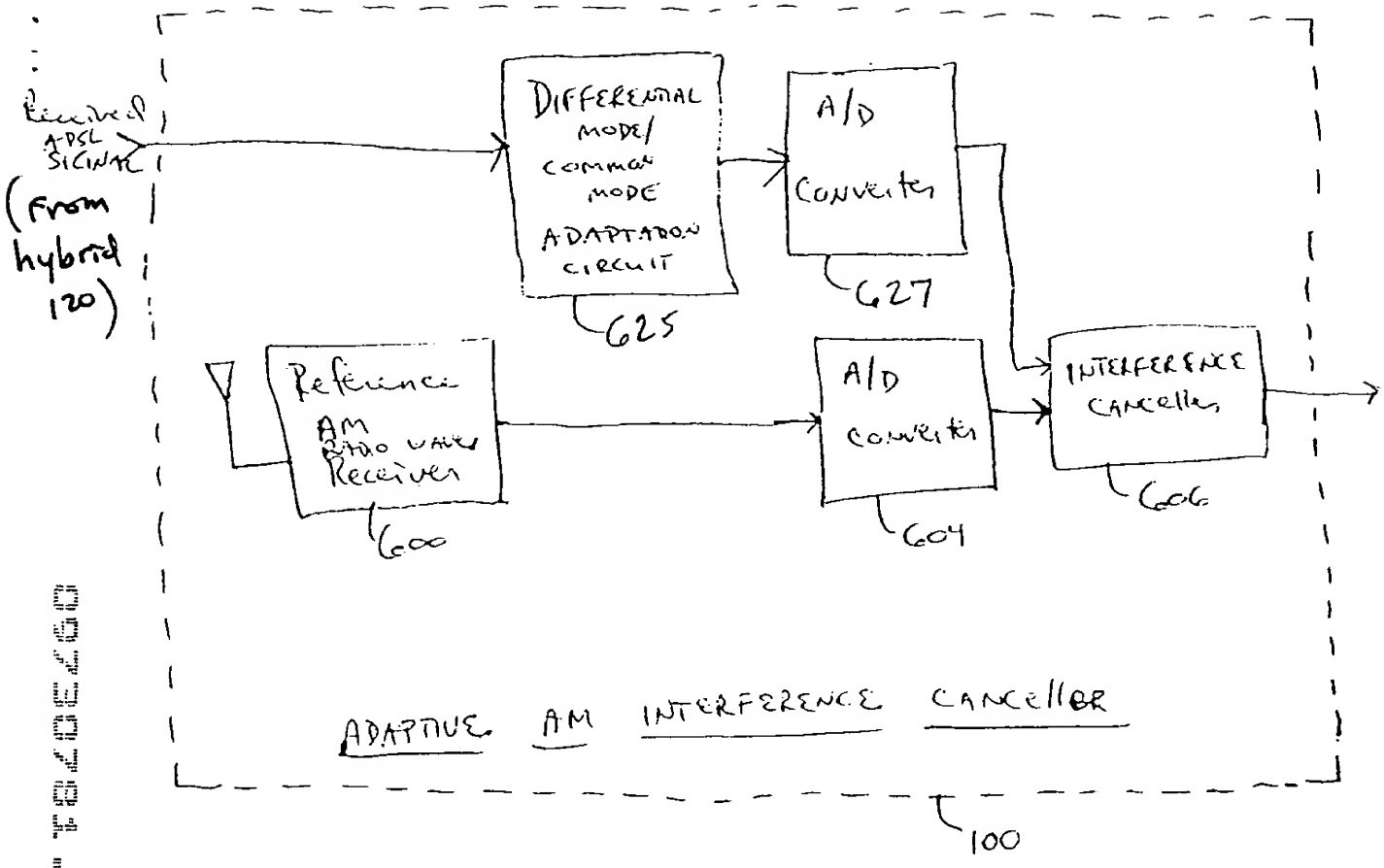

Received ADSL SIGNAL (from hybrid 120)
DIFFERENTIAL MODE/ COMMON MODE ADAPTATION CIRCUIT
625
A/D CONVERTER
627
REFERENCE AM RADIO WAVE RECEIVER
600
A/D CONVERTER
604
INTERFERENCE CANCELLER
606
ADAPTIVE AM INTERFERENCE CANCELLER
100

FIG. 5

DIFFERENTIAL MODE/COMMON MODE
ADAPTATION CIRCUIT

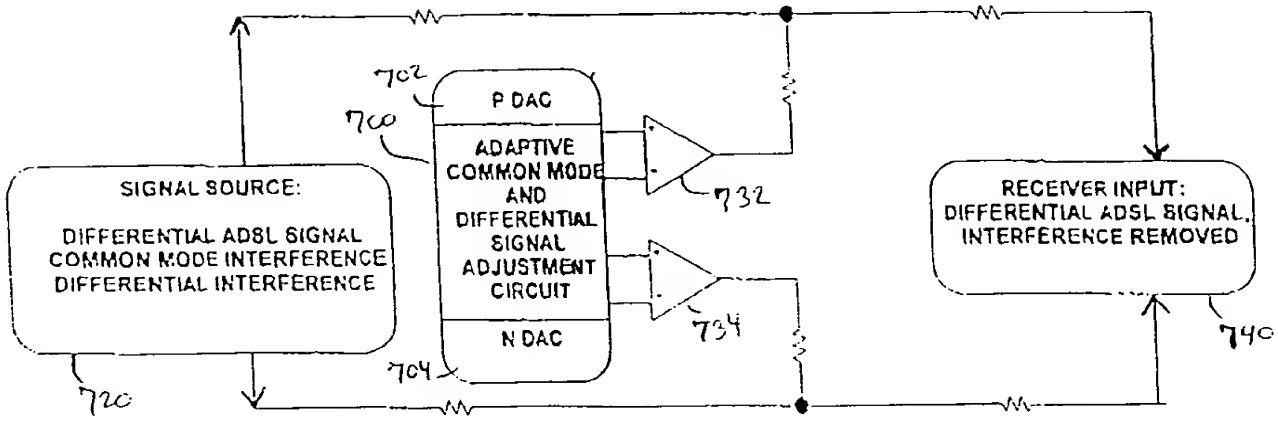
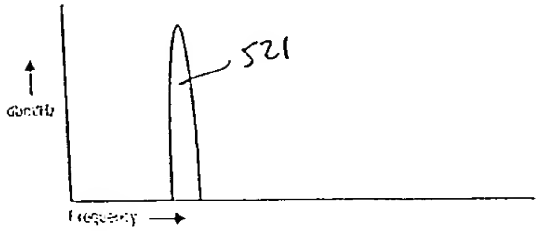


FIG. 6

47

09/2003 - 18:24:28

Traditional Analog Bandwidth Usage

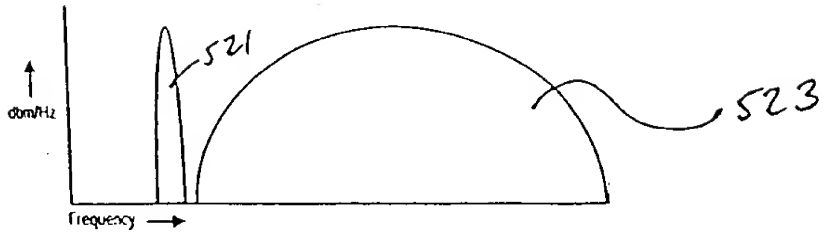


Voice

300Hz 4KHz

FIG. 7

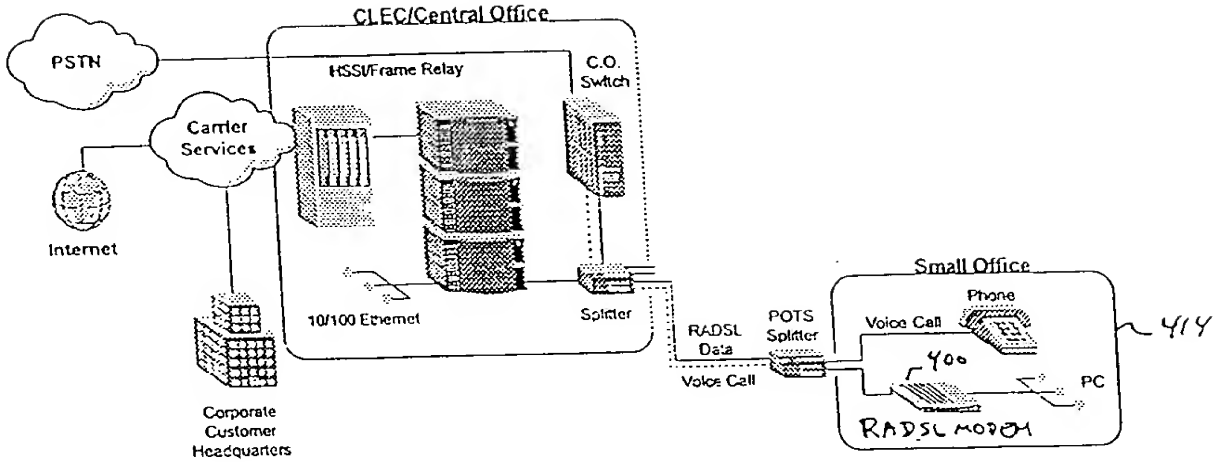
DSL Bandwidth Usage



Voice DSL Bandwidth

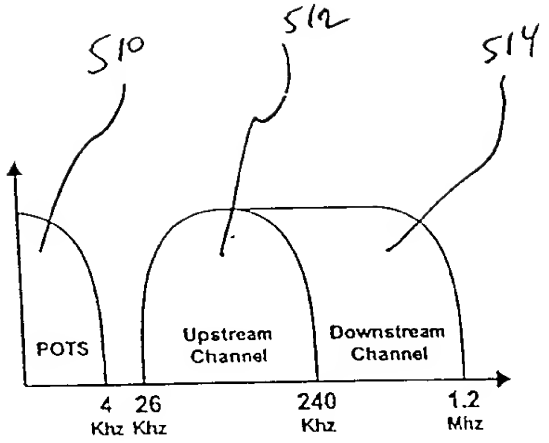
300 - 4KHz 1.2MHz

FIG. 8



PRIOR ART

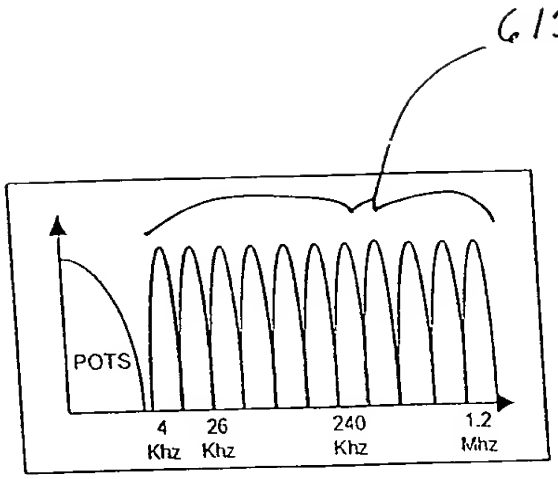
FIG. 9



Spectral distribution of RADSL CAP

FIG. 10

09/908,249



Spectral Distribution of RADSL-DMT

FIG. 11

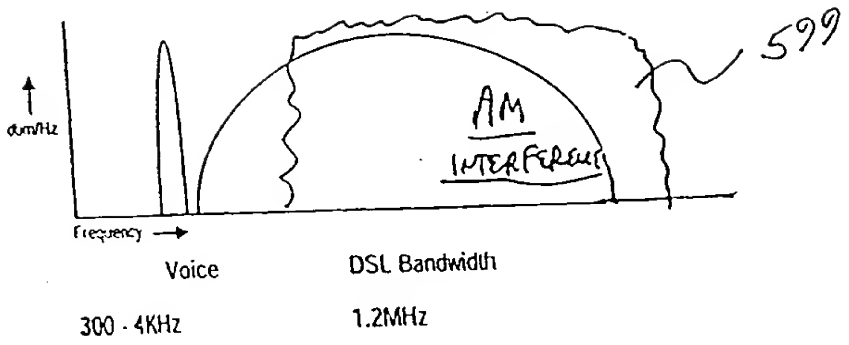

599
AM
INTERFERENCE
dbm/Hz
Frequency
Voice
DSL Bandwidth
300 - 4KHz
1.2MHz

FIG. 12